

Description of Application for Modification of License

1.0 OVERVIEW

This application seeks to modify the current Row 44, Inc. (“Row 44”)¹ Ku-band Earth Stations Aboard Aircraft (“ESAA”) license (Call Sign E080100) to add an additional remote antenna functioning with additional satellite points of communication.² The new antenna is closely related to the existing SAA antenna. The new aircraft-mounted transmit/receive antenna is the 0.63 meter QUEST Global Satellite Antenna Assembly (“GSAA”), which is identified as Remote Terminal #3 in the FCC Form 312 that is part of this application. This modification application also seeks to add two of the new points of communication for use with its existing SAA/TECOM antenna – both AMC-3 at its new 72° W.L. orbital location (*see* n.2) and Intelsat 29e at 50° W.L. Except as identified in the attached Technical Annex and the Form 312, there are no other changes proposed to the technical parameters contained in the current ESAA license. In particular, with respect to the SAA antenna, the only changes sought are in the satellite points of communication used and the related addition of frequency bands used on these satellites. Other transmit operating parameters remain unchanged for Remote Antenna #2.

The Schedule B information submitted with this application contains only the parameters that apply to the GSAA antenna and the additional authority requested for the SAA antenna and are not intended to replace entirely the parameters specified in the current authorization that apply to the TECOM/QUEST SAA antenna or the Aerosat antenna that were previously authorized. The modification requested herein will provide enhanced service capability and reliability for airline passengers on flights operating throughout North America and in airspace beyond CONUS by allowing increased system capacity and more robust performance. Except as specifically set forth herein and in Schedule B, Row 44 seeks these modifications subject to all terms and conditions set forth in its current license.³

¹ The in-flight connectivity business established by Row 44 now operates under the name Global Eagle Entertainment, which is the parent company of Row 44 (*see* IBFS File No. SES-T/C-20121203-01063). As Row 44 remains the name of the FCC licensee, that designation is used in this application.

² Row 44 notes that the FCC’s IBFS database indicates that AMC-3 is located at 67° W.L., although the FCC has authorized its relocation to its current location at 72° W.L. (FCC File No. SAT-MOD-20161025-00102). *See* FCC Public Notice, Report No. SAT-1196, at 1 (released October 28, 2016) (announcing SES’s notification of this fleet management maneuver and stating that SES “may commence relocation of AMC-3 no earlier than November 24, 2016, without further authorization by the Commission”).

³ *See* Row 44 Inc., Radio Station Authorization, Call Sign E080100, File No. SES-MFS-20150928-00635, as amended by SES-AFS-20160614-00506 (Sat. Div., granted Aug. 19, 2016).

Row 44 seeks to implement service using both its SAA and GSAA antennas pursuant to this modification application as soon as practicable, and respectfully requests that this modification application be placed on Public Notice as quickly as possible in order to facilitate this projected implementation schedule. To the extent necessary, Row 44 may need to seek Special Temporary Authority to permit modified service in advance of final action on the entirety of the current request for modification.

2.0 TECHNICAL DESCRIPTION, LINK BUDGETS AND PREDICTED COVERAGE AREA

The Technical Annex attached hereto includes a technical description of the proposed new antenna. A full complement of EIRP Spectral Density Plots, prepared in accordance with Section 25.115(g)(1) of the Commission's Rules, is provided in Exhibit A, depictions of the coverage contours of all satellites to be used are included in Exhibit D, and representative link budgets can be found in Exhibit E. See 47 C.F.R. § 25.227(b)(4).

3.0 COORDINATION LETTERS

Row 44's intended operations are within the scope that the operators of the satellites requested as points of communication have coordinated with adjacent satellite operators, and should not cause harmful interference into adjacent satellites operating in accordance with FCC's two-degree spacing policy. Copies of the coordination letters covering Row 44's proposed new operations with the satellites identified in Table 1 are attached hereto as Exhibit B. See 47 C.F.R. § 25.227(b)(2). The coordination letters provided with respect to AMC-3 at 72° W.L. (two separate letters) and Intelsat 29e at 50° W.L. (single letter) cover operations using both transmitting antennas.

Row 44's operations, as modified, will continue to conform to the terms of its existing coordination agreements with the National Aeronautics and Space Administration ("NASA") and the National Science Foundation ("NSF"), as required under Condition 90057 its current ESAA license.⁴ Copies of these existing coordination agreements are also included in Exhibit B.

⁴ Row 44's coordination agreements with NASA and NSF pre-date the adoption of current rule Sections 25.227(c)(1) & (d)(1), which provide for Public Notice to allow comment on coordination agreements governing operations of ESAA networks in frequency bands shared with NASA and NSF facilities. Accordingly, to the extent necessary, Row 44 requests that the Public Notice issued announcing acceptance of this modification application include the referenced notifications concerning Row 44's existing coordination agreements with NASA and NSF.

4.0 RADIATION HAZARD STUDY

Exhibit C to this application is a radiation hazard assessment for the new antenna, submitted pursuant to Section 25.227(b)(8) of the Commission's Rules, reflecting the operating parameters specifically requested for the GSAA antenna.

5.0 USE OF EXTENDED KU-BAND DOWNLINK BAND AND REQUEST FOR WAIVER

Row 44 is seeking expanded authority for both of its active ESAA terminals (SAA and GSAA) to receive transmissions in the 12.2-12.5 GHz portion of the Ku-band downlink spectrum used on IS-29e, as indicated in Form 312. The U.S. table of Frequency Allocations does not include a domestic allocation for FSS in this band.⁵ Accordingly, Row 44 requests that its current waiver of Section 2.106 of the FCC's Rules, which allows operation in the 12.2-12.5 GHz portion of the band on a non-conforming, non-interference basis using the IS-19 satellite,⁶ be extended to cover this portion of the extended Ku-band downlink spectrum for use on IS-29e as well.

The 12.2-12.5 GHz downlink is not allocated to the FSS in ITU Region 2 (the Americas), but is allocated for such service in the space-to-Earth direction in both Region 1 (Europe/Africa) and Region 3 (South Asia/Pacific). Because Row 44's operations will occur largely in these areas and not over the continental U.S., these operations are consistent with the global spectrum allocation specified for this band. In this connection, the Commission has previously recognized that mobile applications in FSS bands are free to operate in the extended Ku-band "in ITU Regions 1 and 3 in accordance with the rules of the administrations whose waters they operate in."⁷

Transmissions from IS-29e to Row 44 remote terminals will serve aircraft flying primarily over the international waters of the Atlantic Ocean and Canada, during flights between Europe and North America. These operations will allow passengers to access information on the

⁵ See 47 C.F.R. § 2.106.

⁶ See Current Row 44 License, Call Sign E080100, FCC File No. SES-MFS-20150928-00635, Condition 90162 (granted August 19, 2016) (granting authority for "space-to-Earth operations, on an unprotected, non-interference basis, in the 12.25-12.75 GHz frequency band from Intelsat 19 in ITU Region 2, including portions of U.S. airspace").

⁷ *Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands*, 20 FCC Rcd 674, 711 n.224 ("Though the Commission's rules do not have extraterritorial application, we acknowledge that the Ku-band is not harmonized on a world-wide basis and thus, U.S.-licensed ESV operators are free to operate in the Ku-band in ITU Regions 1 and 3 in accordance with the rules of the administrations whose waters they operate in, including portions of the Ku-band not used by the United States").

Internet and to send international communications. The Commission has previously acknowledged that “terminals on U.S. registered aircraft may need to access foreign satellites while traveling outside the United States (e.g., over international waters), and therefore may need to downlink in the extended Ku-band in certain circumstances.”⁸ Acting on this general statement, it has granted similar waiver requests to Row 44 and others to use this same portion of the extended Ku-band downlink for service to U.S. passenger aircraft.⁹ Row 44 asks that any waiver granted in this instance encompass the entire coverage area of the IS-29e satellite, as these operations will take place mostly over open ocean waters and reception of these transmissions will not pose any increased interference risk either to users of terrestrial fixed service facilities that may be operating in this band or to Row 44’s own operations.

Row 44’s proposed operations in these bands are covered in the coordination letter for IS-29e attached as part of Exhibit B. Moreover, because the Row 44 terminals will be receiving only in these spectrum bands the signals of already operating GSO FSS satellites, Row 44’s operations will pose no significant interference risk to current spectrum users, and Row 44 will accept any interference from such users. Row 44 will cease operation in the unlikely event that any interference is caused to existing primary service users in the requested bands. Under these circumstances, grant of the requested waiver of Section 2.106 is consistent with both Commission precedent and the public interest.

[See Chart on Next Page]

⁸ *Service Rules and Procedures to Govern the Use of Aeronautical Mobile-Satellite Service Earth Stations in Frequency Bands Allocated to the Fixed-Satellite Service*, 20 FCC Rcd 2906, 2917 (¶ 18) (2005).

⁹ *See Gogo LLC*, FCC File No. SES-MFS-20160824-00738, Call Sign E120106 (granted December 13, 2016) (granting authority to access the entire 12.2-12.75 GHz band on Intelsat 20, Intelsat 33e and ASTRA 4A); *Panasonic Avionics LLC*, SES-MFS-20150609-00349, Call Sign E100089 (granted June 30, 2016) (granting authority to access the entire 12.2-12.75 GHz band on multiple satellites).

6.0 SPACECRAFT, FREQUENCY & BEAM COVERAGE

**Table 1: Spacecraft, Frequency & Beam Coverage Table
 (All Provide Some Coverage to U.S. Locations)**

Satellite	Location	Beam Coverage Area	Tx (GHz)	Rx (GHz)	Satellite Operator
AMC-1	129.15 W	North America, Central America and Pacific	14.05-14.47	11.7-12.2	SES
AMC-2	84.85 W	North America, Caribbean and North Atlantic	14.05-14.47	11.7-12.2	
AMC-3	72.0 W	North America, Central America, Atlantic and Caribbean	14.05-14.47	11.7-12.2	
AMC-9	83.0 W	North America, Caribbean, Central America and North Atlantic	14.05-14.47	11.7-12.2	
SES-1	101.0 W	North America, Central America, Pacific and Caribbean	14.05-14.47	11.7-12.2	
IS-29E	50.0 W	North America, Central America, South America, North Atlantic and Caribbean	14.05-14.47	10.95-11.2, 11.2-11.45, 11.45-11.7, 11.7-12.2, 12.2-12.5	Intelsat
Eutelsat 115WB*	114.9 W	North America, North Atlantic and Pacific Ocean	14.05-14.47	11.7-12.2	Eutelsat

* = Non-U.S.-licensed satellites included on Ku-band Permitted List

 = Satellite previously authorized for SAA antenna at a different orbital location

 = Points of Communication Currently Authorized for SAA antenna

7.0 TELEPORT UPLINK LOCATIONS

Table 2
Teleport Locations for Provision of Service Within the United States

Satellite	Orbital Location	Teleport Location(s)	Site Operator	Call Sign(s)
AMC-1	129.15 W	Woodbine, VA (until May 2017) Holmdel, NJ (from May 2017)	SES Hughes	E900448 & E140054 E160163
AMC-2	80.85W	Woodbine, VA (until May 2017) N. Las Vegas, NV (from May 2017)	SES Hughes	E900448 & E140054 E940460
AMC-3	72.0 W	Holmdel, NJ	GEE/MTN	E160163
AMC-9	83.0W	North Las Vegas, NV	Hughes	E940460
SES-1	101.0W	North Las Vegas, NV	Hughes	E940460
IS-29E	50.0 W	Holmdel, NJ	GEE/MTN	E160163
Eutelsat 115WB*	114.9W	Southfield (Detroit), MI	Hughes	E990170

* = Non-U.S.-licensed satellites included on Ku-band Permitted List

8.0 LICENSEE CERTIFICATION

I, Simon McLellan, Chief Engineer of Row 44, Inc., hereby certify as follows:

1. The target space station operators for the satellites subject to this modification application have confirmed that proposed Earth Stations Aboard Aircraft operations are within coordinated parameters for adjacent satellites up to 6 degrees away on the geostationary arc; and
2. The licensee will continue to comply with the requirements of paragraphs (a)(6), (a)(9), (a)(10), and (a)(11) of Section 25.227 of the Commission's Rules and the conditions of its existing license.



Simon McLellan
Chief Engineer
Row 44, Inc.
Global Eagle Entertainment

January 25, 2017